DOCUMENT RESUME

ED 187 401 JC 800 346

AUTHOR Kordic, Michael G.
TITLE Report on the Application of Workforce Planning Methodology in the Cuyahoga County Sanitary Engineers Operations and Maintenance Sections.
INSTITUTION Cuyahoga Board of County Commissioners, Cleveland, Ohio.; Cuyahoga Community Coll., Cleveland, Ohio.
PUB DATE Apr 80
NOTE 70p.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Administrative Organization; Demand Occupations; *Employment Projections; *Human Resources; *Labor Force Development; Labor Needs; Labor Turnover; Labor Utilization; On the Job Training; *Resource Allocation; Vocational Education; *Waste Disposal
IDENTIFIERS Ohio (Cuyahoga County)

ABSTRACT

Progress to date is reported for a project initiated in 1979 to apply a workforce planning methodology to the operations and maintenance sections of the Cuyahoga County Sanitary Engineering Department in an effort to document the human resources utilized by the Department during 1979 and to determine its personnel needs for 1980 and 1981. After introductory material noting the growth in the number and size of wastewater treatment plants and the concomitant need for additional personnel and training, the report outlines the methodology and outcomes for seven project tasks: (1) define the amount of work being performed by both the operations and maintenance sections, (2) develop workforce planning criteria, including coded occupational titles, organizational charts, and training catalogs which match relevant courses at local educational institutions to each position; (3) take a personnel inventory to determine the type of work to which each employee is assigned and the additional jobs s/he is qualified to do; (4) establish staff requirements to determine how many and what types of positions will need to be filled each year; (5) forecast new-hires and transfers; (6) estimate the man-years to be worked through 1981; and (7) develop a training program for new employees and for upgrading or updating job skills. Charts illustrating the outcomes for each task are provided, as are summary conclusions and recommendations. (JP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED187401

REPORT ON THE APPLICATION OF WORKFORCE PLANNING METHODOLOGY IN THE CUYAHOGA COUNTY SANITARY ENGINEERS OPERATIONS AND MAINTENANCE SECTIONS

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Michael Kordic

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

MICHAEL G. KORDIC

RESEARCH ASSOCIATE

TO THE

HUMAN RESOURCE/MANPOWER PROJECT

APRIL, 1980

A jointly funded effort by
the Board of County Commissioners
and Cuyahoga Community College

Dr. George Eppley, Project Director

JC 800 346

ABSTRACT

The manpower planning process, as developed by Workforce Planning Associates, of McLean Virginia, has been adapted for use in the Cuyahoga County Sanitary Engineer's Operations and Maintenance sections. This report contains a description of the process and the products that were a result of it. The purpose was to determine the employment and training needs for this department. It also determines selected characteristics of current and expected employment. It demonstrates a process for identifying needs and manpower planning methodology for meeting them. The goal is to develop training plans and action steps in response to current and expected manpower training needs and manpower problems.

The operation and maintenance sections were found to be relativly stable in regards to new hires separations and transfers. In the 1979 to 80 period there were 28 personnel actions identified for net change of -2. In the 1980-81 period there were 47 personnel actions identified for a net change of +5.

Training courses, workshops and seminars were identified from a variety of sources. Of the classes presently listed in Cuyahoga Community College's catalog, 14 were found that directly meet the needs of the Sanitary Engineer based on their content. Five course areas not listed were identified in which the college could offer immediate listings. One of which has been planned. An associate degree program in wastewater treatment also is recommeded.

TABLE OF CONTENTS

	TITLES	PAGE
I.	Introduction	1
II.	Methodology and Products	3
	Task 1 - Definition of Workload	3
	Task 2 - Develop Workforce Planning Criteria	7
	A - Occupational Titles and Definitions	7
	B - Table of Organization	8
	C - Career Ladder	10
	D - Training Catalog	10
	Task 3 - Develop Personnel Inventory	14
	Task 4 - Develop Staffing Requirements	14
	A - Administrative Staffing Requirements	17
	B - Treatment Plants, Package Plants and Lift Stations Staffing Requirements	17
	C - Maintenance Yards Staffing Requirements	21
	D - Staffing Requirements Summaries	21
	Task 5 - Forecast New Hires and Transfers	26
	A - Workforce Transition Analysis	26
	B - Analysis of Workforce Needs	31
	Task 6 - Develop Staffing Plan	31
	Task 7 - Develop a Training Plan	33
III.	Conclusions	38
IV.	Problems	38
V.	Recommendations	38

EXHIBITS

		PAGE
I.	Laboratory Testing Workload Estimates	4
II.	Career Ladder	11
III.	Training Catalog	12
IV.	Personnel Inventory	16
V.	Administrative Staffing Requirements	18
VI.	Wastewater Treatment Plants Staffing Requirements	19
VII.	Package Plants and Lift Stations Staffing Requirements	20
VIII.	Maintenance Yards Staffing Requirements	22
IX.	Staffing Requirements Summary '79	23
X.	Staffing Requirements Summary '80	24
XI.	Staffing Requirements Summary '81	25
XII.	Workforce Transition Analysis 1979-80	27
XIII.	Workforce Transition Analysis 1980-81	28
XIV.	Analysis of Workforce Needs 1979-80	29
XV.	Analysis of Workforce Needs 1980-81	30
XVI.	Staffing Plan	32

TABLES

I.	1978 Workload	6
II.	Occupational Titles	8
III.	Organization Chart	9

APPENDIXES

I.	Training Catalog Course Descriptions	41
II.	Cost of Workforce Planning	47
III.	Workforce Planning System	48

I. INTRODUCTION

This report presents the progress to date on the application of a workforce planning methodology in the Operations and Maintenance Sections of the Cuyahoga County Sanitary Engineer.

This pilot project was conducted by the staff of the College/County Manpower Project under the direction of Dr. George Eppley. Assistance was provided by Mr. Stephen Sebesta, director of the county department, and his staff. Expert consultant services came from Mr. Morton Ettelstein of Workforce Planning Associates (formerly, Chief of the Manpower Planning Section, Municipal Operations and Training Division, Office of Water Program, Environmental Protection Agency).

The goal of this pilot project is to document the human resources utilized during 1979 and to determine the needs for 1980 and 1981. The purpose of identifying this project on workforce planning is to make aware, and possibly dupicate in, other units of county, city and state government. It would enable them to forecast their own staffing, recruitment and training needs.

In an era of inflated material and salary costs, combined with increasing taxpayer demand for fiscal accountability from government, workforce planning ensures that the right number and the right kind of people are in the right place at the right time. Since it is usually preferable to promote within an organization rather than hire from outside, workforce planning allows for enough lead time to develop existing personnel. Then when new people are hired, they can be brought in at a lower and less critical level.

The major aspects of change that affect the demands placed upon a workforce in wastewater treatment plants are the growth in the number and size of the plants, the change in technology of wastewater treatment, and the various elements of transformation that occur within a given level of employment. Over time both the number and size of wastewater treatment plants have increased. As such changes continue, they will generate an ongoing need for additional personnel. In

addition to this source of growth in the level of employment more people will be required to fill positions vacated by individuals who, for a variety of reasons, terminate their employment. As changes in technology of wastewater treatment occur and as changes in water quality standards call for more reliability in the performance of wastewater treatment plants, not only will additional personnel be needed, but the qualifications of many of those currently employed will have to be updated. All of these changes will require imaginative additions to existing training program.

II. METHODOLOGY AND PRODUCTS:

This approach essentially followed the Workforce Planning Methodology. However, all the suggested steps were not followed nor were all the products produced. It was necessary to modify the suggested products and to add additional steps and products in order to meet the conditions of the County Sanitary Engineer's Operations and Maintenance Sections. The following is a description of the tasks accomplished and the products produced. Tasks were not accomplished in the indicated sequence. Some were done concurrently and some repeated as a result of subsequent determinations.

Task 1 - Definition of Workload

The purpose of this task is to objectively define the amount of work that is being performed to provide a data base for developing the staffing requirements.

The Operations and Maintenance Division of the Cuyahoga County Sanitary Engineering Department is responsible for the maintenance of a system of collection sewers and the treatment of wastewater.

Plant Operations is responsible for operating and maintaining wastewater treatment plants and pumping stations to meet National Pollutant Discharge Elimination System (NPDES) requirements. Under the Chief of Operations, 16 wastewater treatment plants, 15 sewage pumping stations, a meter vault, and two regulator stations are operated. The plants range in size from 16,000,000 gallons per day to 36,000 gallons per day. These plants treat an estimated 5.565 billion gallons of sewage yearly. Plant Operations is also responsible for laboratory support (sampling and analysis), data collection from all plants and preparation of NPDES reports, and operations research and development.

Two of the treatment plants, Rocky River and Middleburg Heights, have laboratory facilities which perform tests according to NPDES standards. Two lab technicians and one chemist perform this function. The Laboratory Testing Workload Estimates (Exhibit I) display the types of tests

(EXHIBIT I) LABORATORY TESTING

WORKLOAD ESTIMATE

Organization County Sanitary Engineer

Department Operations & Maintenance

Prepared by M. Kordic/N. Hill

Date 1/25/80

Determinations Per Wk. #4 Mo. Yr. For Sept. '79 '80 '81

Personnel

Rocky River: Chemist
Lab Technician

Middleburg Heights: Lab Technician

LOCATION	Suspended Solids	Non-Settleable Solids	Total & Volatile Solids	BOD_5	COD	NH_3 & TKN *	PO_4, Soluble PO_4	Turbidity	D.O., Temperature	Ph	Fecal Coliforms	Oil & Grease	Volatile Acids & Alkalinity	Digester Gas CO_2	Chromium	Total Solids & Volatile Solids	Research & Development Test	NO_2 & NO_3
Rocky River Lab	29	15	12	23	15	4	20	5	30	30	27	1	21	2	4	19		
Middleburg Heights Lab	30	-	-	20	-	6	6	-	30	30	-	-	-	-	-	7		6
Total	59	15	12	43	15	10	26	5	60	60	27	1	21	2	4	26		6

*NH_3 only for Middleburg Hgts.

performed at each location for the 4th week of September, 1979.

The maintenance section, under a Chief of Maintenance, has a responsibility for an estimated 600 miles of sanitary sewers in parts of or all of 29 different communities in Cuyahoga County. In 1978 approximately 104 miles of sewer were cleaned and the Maintenance Department responded to 3749 calls for removing blockages in lines or service connections. The Maintenance Section provides emergency and preventive maintenance, inspection, equipment maintenance, prepares maintenance records and reports, and maintains the grounds of the maintenance yards.

Table I presents a Workload summary of 1978 performance measures.

TABLE 1: 1978 Workload

District #	Sewage Treated* (000)	Lineal Feet of Sewer Main Cleaned (000)	Sewer Maintenance Service Calls
East:			
3	82,309	229.2	1259
5	-	130.8	657
9	-	11.1	48
20	200,744	1.8	2
Non-Sewer District	108,516	12.0	39
TOTAL	391,569	384.9	2002
West:			
1	-	112.6	1323
2	10,942	4.8	43
8	629,980**	15.9	243
13	510,786***	29.5	132
14	23,790	3.0	6
TOTAL	1,175,498	165.8	1747
TOTAL EAST AND WEST	1,567,067	550.7	3,749

* In gallons
** Meter Inoperative - June, July, August; plus three (3) weeks each in May and December
*** Partial reading; meter deficiencies

These figures which indicate the workload for operations and maintenance will be updated and further refined as data for 1979 becomes available.

Task 2 - Develop Workforce Planning Criteria

Workforce planning is part of the management function. It consists of a series of integrated and iterative tasks directed to the development of information and recommendations for making cost effective decision on the recruitment, development and utilization of human resources. In order to build and maintain a body of workforce planning criteria four concepts need to be developed:

1. An occupation structure consisting of titles, codes and definitions which table and define the duties qualifications, training requirements, and relationships of the various positions within the organization.
2. Time standards and staffing guides developed with work measurement techniques to translate workloads into qualitative/quatitative manpower requirements.
3. Training catalog to relate specific training courses with occupations and provide information on costs, time required and sources of training delivery.
4. Career Ladder to identify upward mobility for employees within the organization.

A complete description of the entire workforce planning process is contained in Appendix III.

In line with the suggestions in the Workforce Planning Methodology, reference was made to the EPA Manpower Planning Criteria Manual in the accomplishment of the steps involved in this task. However, the EPA criteria did not completely fit the county sanitary engineer's situation and were significantly changed. The EPA criteria did provide a model for the products which were developed.

A. Occupational Titles and Definitions

An in-house system of occupational codes had been established which only needed some refinements and to be expanded. Those which are used in the operations and maintenance sections are listed in table II.

TABLE II: OCCUAPTIONAL TITLES

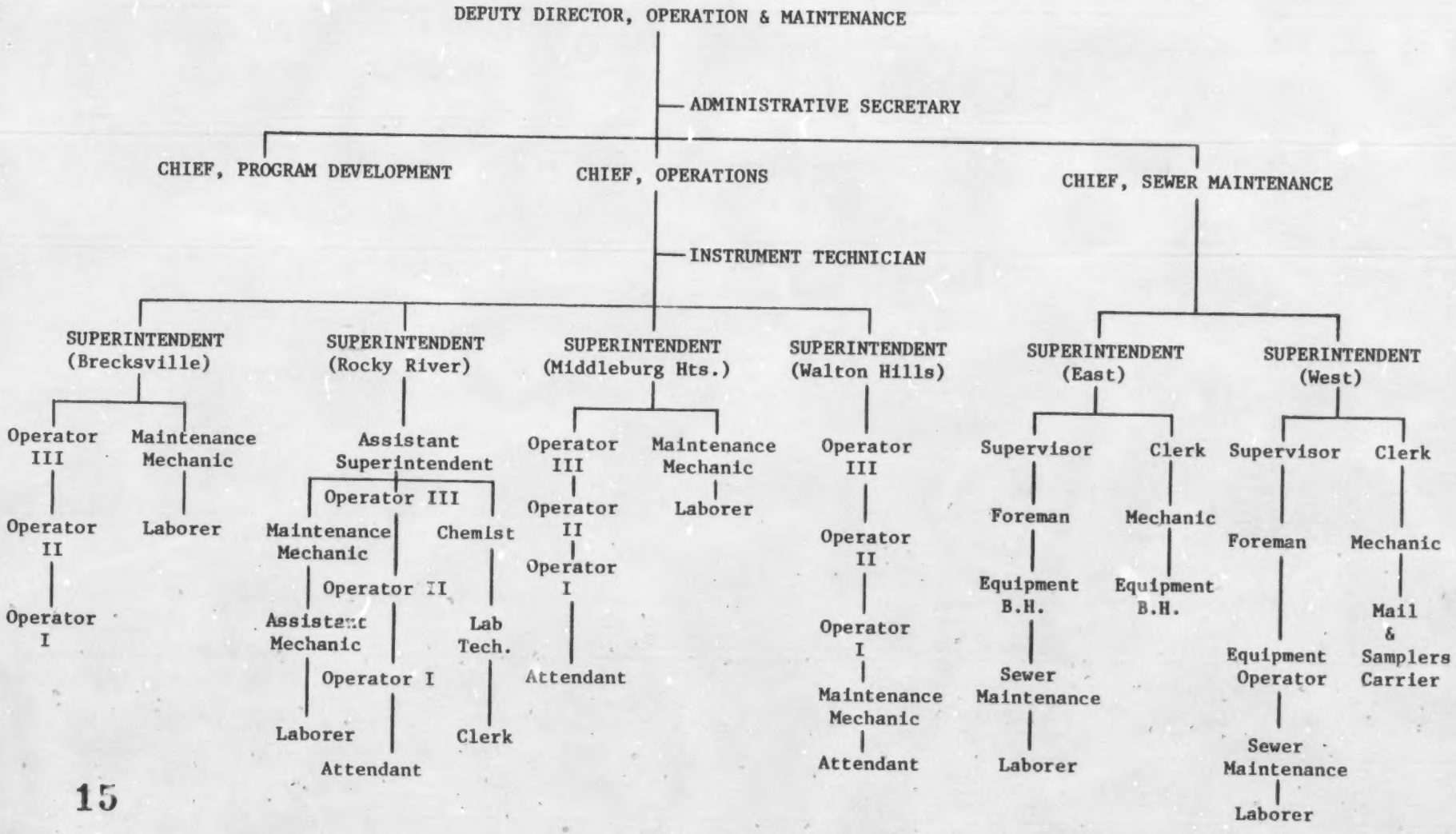
OCCUPATION	CODE
Administrative secretary II	0400
Assistant maintenance mechanic	0800
Attendant	0900
Chemist IV	1000
Chief, Plant Operation	1200
Chief, Program Development	1300
Chief, Sewer Maintenance	1400
Clerk	1700
Deputy Dir., Oper. & Maintenance	1900
Equipment & Backhoe Operator	2600
Equipment Operator	2700
Foreman, Sewer Maintenance	2800
Instrument Technician/IX	3300
Laborer (Local 48)	3400
Laborer (Local 1099)	3500
Maintenance Mechanic (1099)	3600
Maintenance Mechanic I (48)	3700
Maintenance Mechanic II	3800
Operator I	3900
Operator II	4000
Operator III	4100
Superintendent/WW TP	5300
Superintendent/Sewer Maintenance	5400
Technician V/Lab Tech. II	5500
Sewer Maintenance I	5800
Assistant Superintendent	5900
Supervisor (Maintenance Crews)	6000
Mail and Samples Carrier	6100
Building Maintainer	6200

Within the department there also exists a set of position descriptions which define most of the position in Table II. During this project this list had undergone some changes and therefore some changes in the position descriptions need to be made. This topic will be returned to in the recommendations section.

B. Table of Organization

The operations and maintenance sections were already part of a functional table of organization of the county sanitary engineer. During the project the maintenance section was re-organized along the lines of specialization by type of work. The table of organization for operations and maintenance is summarized in Table III.

TABLE III ORGANIZATION CHART FOR OPERATIONS AND MAINTENANCE



15

This chart indicates the distribution of occupations in the operations and maintenance sections of the county sanitary engineer. It does not represent a chain of command below the level of superintendent. What is shown is the occupational titles assigned to each functional service area.

16

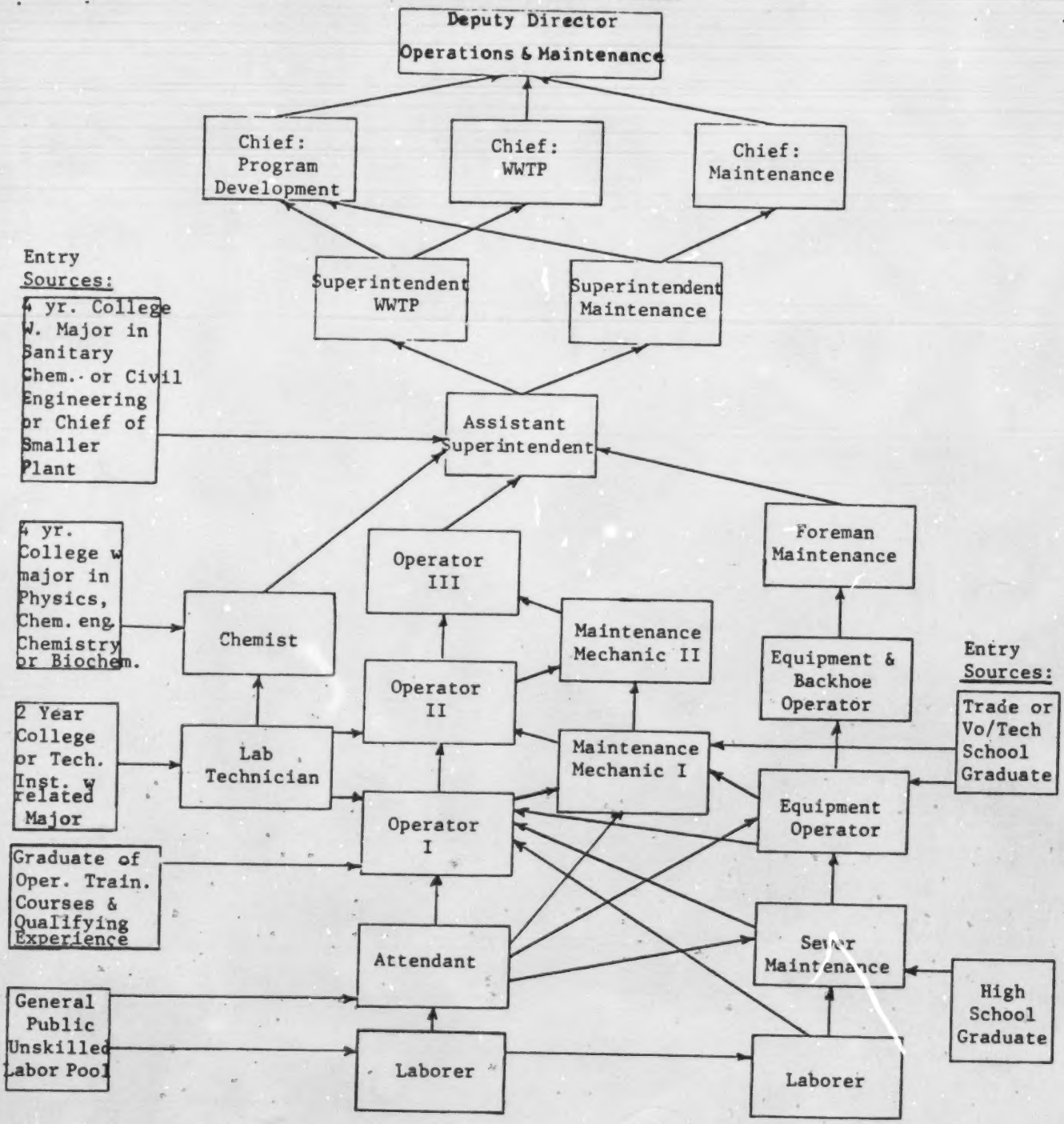
C. Career Ladder

The Career Ladder (Exhibit II) essentially represents management's judgement, based on past experience, on the desirable and practical sources of recruitment and paths of advancement in the organization. The Career Ladder was developed and refined through information and review provided by several management level persons in the department.

D. Training Catalog

The Training Catalog (Exhibit III) is designed to relate training programs, workshops and seminars to the appropriate occupational titles. Pertinent courses were identified through management's judgement and past experiences. A short description of the courses identified are contained in Appendix I.

(EXHIBIT II) CAREER LADDER



(EXHIBIT III) TRAINING CATALOG

Organization: County Sanitary Engineer
Department: Operations & Maintenance
Prepared By: M.Kordic/N.Hill
Date: 1/25/80

An "X" in the matrix indicates applicable training courses to each occupation

Sponsor	Course Area & Number	Course Title	0400 Administrative Secretary II	0800 Assistant Maintenance Mech.	0900 Attendant	1000 Chemist IV	1200 Chief, Plant Operation	1300 Chief, Program Development	1400 Chief, Sewer Maintenance	1700 Clerk	1900 Deputy Dir., Oper. & Maintenance	2600 Equipment & Backhoe Operator	2700 Equipment Operator	2800 Foreman, Sewer Maintenance	3300 Instrument Technician/IX	3400 Laborer (Local 48)	3500 Laborer (Local 1099)	3600 Maintenance Mechanic (1099)	3700 Maintenance Mechanic I (48)	3800 Maintenance Mechanic II	3900 Operator I	4000 Operator II	4100 Operator III	5300 Superintendent/WW TP	5400 Superintendent/Sewer Maint.	5500 Technician V/Lab Tech. II	5800 Sewer Maintenance I	5900 Assistant Superintendant	6000 Supervisor (Maintenance Crews)	6100 Mail and Samples Carrier	6200 Building Maintainer
CCC	ARCH 221	Building Equipment		X															X	X											
CCC	BADM 101	Intro. to Ind. Mgmt.					X				X																				
CCC	BADM 111	Psychology of Supervison					X				X													X	X						
CCC	BADM 201	Work Simplification				X	X		X		X														X						
CCC	BADM 211	Production Control					X	X	X		X														X						
CCC	BADM 220	Human Relations in Bus.					X		X		X														X						
CCC	CHMT 220	Chemical Instrumentation				X									X																
CCC	ELEC 120	Intro. to Electricity & Electrical Circuits		X											X																
CCC	ENGR 112	Engineering Rept. Constr.				X		X	X		X																				
CCC	INDT 122	Intro. to Mfg. Management																													
CCC	INDT 164	Inventory Control																													
CCC	INDT 261	Intro. to Statictical Quality Control				X		X	X						X																
CCC	MECH 221	Applied Instrumentation													X																
CCC	OAMD 101	Typewriting	X							X																					
CCC	OADM 106	Filing, & Records Control	X							X																					
CCC	PDS 103	Water Treatment																													
CCC	*	Operator I Training		X																											
CCC	*	Operator II Training																			X										
CCC	*	Operator III Training																				X									

(EXHIBIT III) TRAINING CATALOG

Organization: County Sanitary Engineer
Department: Operations & Maintenance
Prepared By: M.Kordic/N.Hill
Date: 1/25/80

An "X" in the matrix indicates applicable training courses to each occupation

ponsor	Course Area & Number	Course Title	0400 Administrative Secretary II	0800 Assistant Maintenance Mech.	0900 Attendant	1000 Chemist IV	1200 Chief, Plant Operation	1300 Chief, Program Development	1400 Chief, Sewer Maintenance	1700 Clerk	1900 Deputy Dir., Oper. & Maintenance	2600 Equipment & Backhoe Operator	2700 Equipment Operator	2800 Foreman, Sewer Maintenance	3300 Instrument Technician IX	3400 Laborer (Local 48)	3500 Laborer (Local 1099)	3600 Maintenance Mechanic (1099)	3700 Maintenance Mechanic I (48)	3800 Maintenance Mechanic II	3900 Operator I	4000 Operator II	4100 Operator III	5300 Superintendent/WW TP	5400 Superintendent/Sewer Maint.	5500 Technician V/Lab Tech. II	5800 Sewer Maintenance I	5900 Assistant Superintendant	6000 Supervisor (Maintenance Crews)	6100 Mail and Samples Carrier	6200 Building Maintainer
CCC	*	Collection Systems Maintenance Training							X					X											X		X	X	X		
CCC	*	WWTP Management Training				X	X		X														X	X				X			
USEPA		Treatment Process Evaluation Seminar					X	X			X																				
USEPA		Pretreatment Seminar						X			X																				
USEPA		Sewer Maintenance Seminar							X																X						
USEPA		Lab Methods			X																				X						
OTCO		Collection System Workshop							X					X											X			X			
OTCO		Extended Aeration Workshop																				X	X	X							
OTCO		Class I Workshop			X															X					X						
OTCO		Class II Workshop			X																X				X						
OTCO		Class III Workshop			X																	X			X						
NSC		Defensive Driving Course								X	X																		X		
		On-Job-Training		X							X	X		X	X	X	X	X							X			X	X		
		National WPCF Meeting				X	X				X																				
		Ohio WPCF Meeting			X			X															X	X	X						
		NE Ohio WPCF Meeting																					X	X	X		X				

* Not presently listed in college catalog

Task 3 - Develop Personnel Inventory

The purpose of this task is to inventory the human resources assigned within an organization. The intent here is to document the number and types of personnel currently being utilized to perform a certain magnitude of work. The Personnel Inventory is displayed in Exhibit IV.

This form was designed to relate existing personnel with the position descriptions. The relation is stated in terms of current position and being qualified for other assignments. This is a useful tool, when kept updated, for quick identification of qualified personnel to fulfill specific needs as they arise. This is especially true when plants and facilities are scattered across the county, such as in the sanitary engineers department, and field managers may not know of all human resources available and centralized direction is required.

Task 4 - Develop Staffing Requirements

The purpose of this task is to determine how many and what types of personnel will be needed for each year. Ideally, time standards which relate the workload measurements to the number and type of personnel required to complete them should have been developed. However, inadequate time and staff restricted their development. Therefore, management decisions based on past experience were used in lieu of time standards.

EXHIBIT IV PERSONNEL INVENTORY

Organization: County Sanitary Engineer
Department: Operations & Maintenance

Prepared by: M.Kordic/N.Hill
Date: 1/25/80

A = Assigned
Q = Qualified

Employee Name	Occupational Code																											
	0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200
Amato, Frank											A																		
Annotico, James																A													
Armella, John			A																										
Atkins, John																			A										
Baron, Augustine											A																		
Bartley, Gerald											A																		
Beck, Paul					A																								
Blanchard, Winslow			A																	Q									
Bokshon, Andrew										A																			
Borsi, James																			A										
Buckingham, Willie												A																	
Busic, Kevin		A																											
Buttita, Louie		Q					A																						
Campbell, James																				A									
Campbell, John						A																							
Capone, Chester		A																											
Cassano, August																							A						
Cassano, William												A																	
Childs, Donna																								A					
Chovan, George																			A										
Christman, Ralph								A																					
Cotsman, Michael																			A										
Cox, Clay														A															
Crankfield, Glen		A																											
Eggert, Kenneth																				Q						A			
Esposito, Ricardo																			A	Q									
Fawcett, Joseph														A															
Flowers, Patrick										A																			
Flynn, Patrick														A															
Frith, Donald										A																			
Garapic, Mary																			Q	Q				A					
Garcia, Roddie										A																			
Gerrick, Robert																				Q	Q								
Gerrick, William																			A	Q									
Gerson, David																					Q	A							
Gima, Michael										A																			
Gnew, Clement																													
Gould, Dennis											A																		
Haase, William																			A										
Harrington, Thomas							A																						
Haselow, Thomas										A																			
Hodges, Anthony														A															
Hrusovsky, Mark																			A										
Hummel, Jeffrey		A																											
Ioffreda, Patsy									A																				
Jackson, Eugene														A															
Jambor, Robert											A																		
Johnson, Penelope																			A										

EXHIBIT IV PERSONNEL INVENTORY

Organization: County Sanitary Engineer
Department: Operations & Maintenance

Prepared by: M.Kordic/N.Hill
Date: 1/25/80

A = Assigned Q = Qualified Employee Name	Occupational Code																										
	0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200
Johnson, Robert														A															
Jones, Aaron			A																										
Kalman, Donald																			A										
Karam, Nasr											A																		
Keating, Michael																		A											
Klesch, Kenneth			A																										
Klimczyk, Gregory											A																		
Knauper, Laura																			Q	A									
Kolakowski, Joseph																										A			
Koston, Richard												A																	
Kovar, Norman								A																					
Kronz, Jack																			Q	A									
Lovsin, Joseph											A																		
Lutz, John			A																										
Marbuary, Reuben			A																										
McManamon, John																		A			Q								
Miadich, Gustave														A															
Misko, Robert																					A								
Montgomery, Dale															A														
Moore, James															A														
Overton, William														A															
Passafiume, Pete												A																	
Pendleton, Willie			A																										
Periandri, Anthony															A														
Plank, Thomas			A																										
Rabbit, Edward																					Q	A							
Rice, Merle	A																												
Romain, Dale																							A						
Rowser, Abraham																				A	Q								
Sardo, John												A																	
Sawyer, James																			Q	A									
Schwartz, William																		A											
Serenas, Sam												A																	
Shively, David																					Q	A							
Simcox, Norman																A													
Simcox, Stanley																	A												
Simeone, Patsy											A																		
Smerillo, John				Q																	Q	A							
Sommer, Jeffrey		A																											
Spino, Alfred													A																
Spracale, Thomas															A														
Strainer, Rudolph															A														
Sutkaytis, Michael															A														
Takacs, Norman																			A										
Tatonetti, John															A														
Tepper, Frank			A																										
Toms, Norman					A														Q	Q	Q								
Veszenyi, William											A																		
Wilson, Alfred															A														
Winborn, Brent															A														

A. Administrative Staffing Requirements

The Administrative Staffing Requirements (Exhibit V) dipicts the personnel necessary for the centralized administration of the sanitary engineers department. These positions are not very sensitive to minor changes in the amount of sewage to be treated or the number of maintenance calls to be made. Major additions or deletions to the entire sanitation system would have to occur before a change in personnel here is required. The only exceptions here would be at the position of administrative secretary, engineer and instrument technician where marginal increases (or decreases) in productivity demand may require more (or less) personnel.

B. Treatment Plants, Package Plants and Lift Stations Staffing Requirements

The next two staffing requirement sheets, for the wastewater treatment plants (Exhibit VI) and the package plants and lift stations (Exhibit VII), should be considered in conjunction with each other. The reason for this is that some personnel from the treatment plants spend part of their time at the package plants and lift stations. They are treated separately in order to evaluate the demand requirement for human resource in each functional area. The Wastewater Treatment Plants Staffing Requirements (Exhibit VI) shows the personnel needed at each of the four staffed plants by occupational title and at each location, then are summed again for each year. The Package Plants and Lift Stations Staffing Requirements (Exhibit VII) follows the same conceptual framework with the exception being the use of service areas (east, south and west) rather than the location of a treatment plant. Totals again are indicated for occupations, service areas and years.

(EXHIBIT V) ADMINISTRATIVE STAFFING REQUIREMENT

Organization: County Sanitary Engineer

Department: Operations & Maintenance

Prepared by: M. Kordic/N.Hill

Date: 1/25/80

Indicator: Positions

Code	Occupation	Year		
		FY' 1979	FY' 1980	FY' 1981
1900	Deputy Director O & M	1	1	1
0400	Administrative Secretary	1	1	1
1300	Chief, Program Development	1	1	1
1200	Chief, Operation WWTP & Pump Stations	1	1	1
1400	Chief, Sewer Maintenance	1	1	1
3300	Instrument Technician	1	1	1
	TOTAL	6	6	6

(EXHIBIT VI) WASTE WATER TREATMENT PLANTS STAFFING REQUIREMENTS

Organization: County Sanitary Engineer

Department: Operations & Maintenance

Prepared by: MK/NH

Date: 1/25/80

Indicator: Man-years

Occupation	Code	FY 79 Brecksville WWTP	FY 79 Middleburg WWTP	FY 79 Rocky River WWTP	FY 79 Walton Hills WWTP	FY 79 TOTAL	FY 80 Brecksville WWTP	FY 80 Middleburg WWTP	FY 80 Rocky River WWTP	FY 80 Walton Hills WWTP	FY 80 TOTAL	FY 81 Brecksville WWTP	FY 81 Middleburg WWTP	FY 81 Rocky River WWTP	FY 81 Walton Hills WWTP	FY 81 TOTAL
Assistant Maintenance Mech.	0800			1.		1.			1.		1.			1.		1.
Attendant	0900		1.	6.	1.	8.		1.	5.	.5	6.5		1.	5.	.5	6.5
Chemist IV	1000			1.		1.			1.		1.			1.		1.
Clerk	1700			1.		1.			1.		1.			1.		1.
Laborer (Local 48)	3400		1.	1.		3.		1.	1.		3.		1.	1.		3.
Maintenance Mechanic I (48)	3700	.7	.85			2.55	1.	.85			2.45	1.	.9			1.9
Maintenance Mechanic II (48)	3800	1.	4.			8.	.6	1.			2.45	.6	2.			3.
Operator I	3900	1.	2.	4.		5.	1.	2.	2.	1.	6.	1.	2.	2.		5.
Operator II	4000	.7	1.			1.7	1.	1.	3.		4.	1.	1.	2.		4.
Operator III	4100						.7	1.			1.7	.7	1.	3.		4.7
Superintendent/WW TP	5300	1.	.95		.4	3.35	1.	.95	1.	.4	3.35	1.	.95	1.	.4	3.35
Technician V/Lab Tech. II	5500	.3	1.	1.		2.3	.3	1.	1.		2.3	.3	1.	1.		2.3
Assistant Superintendent	5900			1.		1.			1.		1.			1.		1.
TOTAL		2.5	8.8	22.	4.7	38.	2.4	8.8	18.	4.6	33.8	0	8.85	18.	0	26.85

(EXHIBIT VII) PACKAGE PLANTS AND LIFT STATIONS STAFFING REQUIREMENTS

Organization: County Sanitary Engineer
Department: Operations & Maintenance
Prepared By: M. Kordic/N.Hill
Date: 1/25/80
Indicator: Manyears

		1979				1980				1981			
Code	Occupation	East	South	West	Total	East	South	West	Total	East	South	West	Total
5300	Superintendent	.5	.3	.05	.85	.6	.5	.05	1.15	.9	1.0	.05	1.95
4000	Operator II	.95	1.0		1.95	1.0			1.0	2.0			2.0
3900	Operator I	2.0			2.0	3.0	1.0	1.0	5.0	2.0	2.0	1.0	5.0
3800	Maintenance Mechanic II (48)	.9	.9	.1	1.9	.9	1.0	.1	2.0	.9	1.6	.1	2.6
3700	Maintenance Mechanic I (48)												
0900	Attendant	2.0	1.0	1.0	4.0	2.0	1.0	1.0	4.0	2.0	3.0	1.0	5.0
	TOTAL	5.35	3.2	1.15	10.7	7.5	3.5	2.15	13.15	7.8	6.6	2.15	16.55

C. Maintenance Yards Staffing Requirements

The Maintenance Yards Staffing Requirements (Exhibit VIII) shows the reorganization process along lines of specialization already underway within the department. This is why the figures for '79 differ from those displayed for '80 and '81. In 1979 and years earlier, work crews were composed as the need arose. As of '79, work crews were organized on a functional basis in the yards. These crews now specialize in house connections, smoke inspection, construction, T.V. inspection and grouting, and a jet crew for sewer maintenance. This allows for more efficient use personnel in scheduling preventive and emergency maintenance.

The staffing requirements are analyzed in the same way for the maintenance yard. It is broken down by year, east and west service areas, and type of crew with the appropriate number of personnel indicated by occupational title and code. Totals are indicated for each occupational title per year, the personnel in each type of crew per year, and the total to provide the maintenance function per year.

D. Staffing Requirements Summaries

Exhibits IX, X, and XI are the Staffing Requirements Summaries for 1979, '80 and '81 respectively. These combine the data from the previous exhibits and show the personnel needed, by occupation and code to perform each function in the operations and maintenance sections. The department totals along with those for each function and occupation, are indicated.

(EXHIBIT VIII MAINTENANCE YARDS STAFFING REQUIREMENTS

Organization: County Sanitary Engineer

Department: Operations & Maintenance

Prepared By: M. Kordic/N.Hill

Date: 1/25/80

Indicator: Positions

*Two Crews

Code	Occupation	1979 EAST Yard Staff	1979 EAST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1979 WEST Yard Staff	1979 WEST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1979 Total	1980 EAST Yard Staff	1980 EAST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1980 WEST Yard Staff	1980 WEST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1980 Total	1981 EAST Yard Staff	1981 EAST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1981 WEST Yard Staff	1981 WEST Crews: House Connection *	Smoke Inspection	Construction	T.V. and Grouting	Sewer Maintenance (Jet) *	1981 Total
5400	Superintendent	1						1						2	1						1						2	1						1					2
5900	Assistant Superintendent	1												1																								
6000	Supervisor (Maintenance Crews)														2.5						1.5						4	2.5						2.5					5
2800	Foreman	4						4						8		2		1	1			2					8		2		1	1			2				10
2600	Equip. & Backhoe Operator	1						1						2		1		1	1			1					3		1		1	1			1				4
2700	Equipment Operator	7						7						14		2		2	1			1					12		2		2	1			2				16
3600	Maintenance Mechanic	1						1						2	1						1						2	1						1					2
5800	Sewer Maintenance I															2		1				2					6		2		1				2				6
1700	Clerk	1						1						2	1						1						2	1						1					2
3500	Laborer (1099)	8						8						16		2					2						8		2					2					8
6100	Mail and Samples Carrier						1						1	2						1	1					1	3	1					1	1					2
6200	Building Maintainer																																						
31	TOTAL	24					1	24					1	48	6.5	1		1	1		1.5	8	2		1		2	50	6.5	1		1	1		2.5	9	2		1		2	58

(EXHIBIT IX) STAFFING REQUIREMENTS SUMMARY

Organization: County Sanitary Engineer

Department: Operations & Maintenance

Prepared by: MK/NH

Date: 1/25/80

For Period: 1/1/79

To: 12/31/79

Indicator: Man-years

FUNCTION \ OCCUPATION	TOTAL	Administrative Secretary II	Assistant Maintenance Mech.	Attendant	Chemist IV	Chief, Plant Operation	Chief, Program Development	Chief, Sewer Maintenance	Clerk	Deputy Dir., Oper. & Maintenance	Equipment & Backhoe Operator	Equipment Operator	Foreman, Sewer Maintenance	Instrument Technician/IX	Laborer (Local 48)	Laborer (Local 1099)	Maintenance Mechanic (1099)	Maintenance Mechanic I (48)	Maintenance Mechanic II (48)	Operator I	Operator II	Operator III	Superintendent/WW TP	Superintendent/Sewer Maint.	Technician V/Lab Tech. II	Sewer Maintenance I	Assistant Superintendent	Supervisor (Maintenance)	Mail and Samples Carrier	Building Maintainer
CODE		0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200
Administration	6	1				1	1	1		1				1																
Treatment Plants	40		1	8	1				1						3				2.55	10	5	1.7	3.45		2.3		1			
Package Plants & Lift Stations	10.7			4															1.9	2	1.95		.85							
Maintenance Sewer System	48								2		2	14	8			16	2							2			1		1	
TOTAL	104.7	1	1	12	1	1	1	1	3	1	2	14	8	1	3	16	2		4.45	12	6.95	1.7	4.3	2	2.3		2		1	

(EXHIBIT X) STAFFING REQUIREMENTS SUMMARY

Organization: County Sanitary Engineer
Department: Operations & Maintenance
Prepared by: MK/NH
Date: 1/25/80
For Period: 1/1/80
To: 12/31/80
Indicator: Man-years

FUNCTION	TOTAL	Administrative Secretary II	Assistant Maintenance Mech.	Attendant	Chemist IV	Chief, Plant Operation	Chief, Program Development	Chief, Sewer Maintenance	Clerk	Deputy Dir., Oper. & Maintenance	Equipment & Backhoe Operator	Equipment Operator	Foreman, Sewer Maintenance	Instrument Technician/IX	Laborer (Local 48)	Laborer (Local 1099)	Maintenance Mechanic (1099)	Maintenance Mechanic I (48)	Maintenance Mechanic II (48)	Operator I	Operator II	Operator III	Superintendent/WW TP	Superintendent/Sewer Maint.	Technician V/Lab Tech. II	Sewer Maintenance I	Assistant Superintendent	Supervisor (Maintenance)	Mail and Samples Carrier	Building Maintainer
OCCUPATION																														
CODE		0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200
Administration	6	1				1	1	1		1				1																
Treatment Plants	33.8		1	7	1				1						3				2.45	6	4	1.7	3.35		2.3		1			
Package Plants & Lift Stations	13.15			4															2	5	1		1.15							
Maintenance Sewer System	50								2		3	12	8			8	2							2		6		4	1	2
TOTAL	102.95	1	1	11	1	1	1	1	3	1	3	12	8	1	3	8	2		4.45	11	5	1.7	4.45	2	2.3	6	1	4	1	2

(EXHIBIT XI) STAFFING REQUIREMENTS SUMMARY

Organization: County Sanitary Engineer
Department: Opeartions & Maintenance
Prepared by: MK/NH
Date: 1/25/80
For Period: 1/1/81
To: 12/31/81
Indicator: Man-years

FUNCTION	TOTAL	Administrative Secretary II	Assistant Maintenance Mech.	Attendant	Chemist IV	Chief, Plant Operation	Chief, Program Development	Chief, Sewer Maintenance	Clerk	Deputy Dir., Oper. & Maintenance	Equipment & Backhoe Operator	Equipment Operator	Foreman, Sewer Maintenance	Instrument Technician/IX	Laborer (Local 48)	Laborer (Local 1099)	Maintenance Mechanic (1099)	Maintenance Mechanic I (48)	Maintenance Mechanic II (48)	Operator I	Operator II	Operator III	Superintendent/WW TP	Superintendent/Sewer Maint.	Technician V/Lab Tech. II	Sewer Maintenance I	Assistant Superintendent	Supervisor (Maintenance)	Mail and Samples Carrier	Building Maintainer
CODE		0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200
Administration	6	1				1	1	1		1				1																
Treatment Plants	26.85		1	6	1				1						2				1.9	4	4	1	1.95		2		1			
Package Plants & Lift Stations	16.55			5															2.6	5	2		1.95							
Maintenance Sewer System	58								2		4	16	10			8	2							2		6		5	1	2
TOTAL	107.4	1	1	11	1	1	1	1	3	1	4	16	10	1	2	8	2		4.5	9	6	1	3.9		2	6	1	5	1	2

Task 5 - Forecast New Hires and Transfers

A. Workforce Transition Analysis

The Workforce Transition Analysis (Exhibit XII and XIII) is used to estimate what personnel movements are expected to occur or should occur in the organizations's personnel profile. In proceeding through this analysis decisions concerning promotions, transfers, new hires and separations must be made. Using data from previous worksheets, the personnel on hand at the beginning of the period and the desired amount for the end of the period are entered in the appropriate columns. The matrix provides a tool for estimating and planning how the workforce will change during that period.

The figures on the diagonal line indicate the number of personnel remaining in an occupational title during the planning period. Any number in the matrix field (off the diagonal) is the number of personnel changing occupations within the department. The numbers in the occupational rows (on the horizontal) indicate transfers from that occupation. The numbers in the occupational columns (on the vertical) indicate a transfer into that occupation. These numbers are then placed in the appropriate summary row and column on the sheet. The number of anticipated separations and new hires are entered in their respective row and column.

The number of transfers, separation and new hires were management estimates. The procedure followed the Workforce Planning Methodology.

(EXHIBIT XII) WORKFORCE TRANSITION ANALYSIS

Organization: County Sanitary Engineer
Department; Operations & Maintenance
Prepared By: M. Kordic/N.Hill
Date: 1/25/80
For Period: 1/1/80 to 12/31/80

Occupation	Code	Begining of Period Total	0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200	Transitions Out	Separations
Administrative Secretary II	0400	1	1																													
Assistant Maintenance Mech.	0800	1		1																												
Attendant	0900	12			11																											1
Chemist IV	1000	1				1																										
Chief, Plant Operation	1200	1					1																									
Chief, Program Development	1300	1						1																								
Chief, Sewer Maintenance	1400	1							1																							
Clerk	1700	3								3																						
Deputy Dir., Oper. & Maintenance	1900	1									1																					
Equipment & Backhoe Operator	2600	2										2																				
Equipment Operator	2700	14										1	12																		1	1
Foreman, Sewer Maintenance	2800	8												8																		
Instrument Technician/IX	3300	1													1																	
Laborer (Local 48)	3400	3														3																
Laborer (Local 1099)	3500	16															8									6				2		
Maintenance Mechanic (1099)	3600	2																2													8	
Maintenance Mechanic I (48)	3700	0																	0													
Maintenance Mechanic II	3800	4																		4												
Operator I	3900	12																			11											1
Operator II	4000	7																				5										2
Operator III	4100	2																					2									
Superintendent/WW TP	5300	4																						4								
Superintendent/Sewer Maint.	5400	2																							2							
Technician V/Lab Tech. II	5500	2																								2						
Sewer Maintenance I	5800	0																									0					
Assistant Superintendant	5900	2																										1	1			
Supervisor (Maintenance Crews)	6000	0																											0			1
Mail and Samples Carrier	6100	1																												1		
Building Maintainer	6200	0																													0	
Transitions In											1															6		1		2		
New Hires																												3				
End of period total			1	1	11	1	1	1	1	3	1	3	12	8	1	3	8	2	0	4	11	5	2	4	2	2	6	1	4	1	2		

(EXHIBIT XIII) WORKFORCE TRANSITION ANALYSIS

Organization: County Sanitary Engineer
Department; Operations & Maintenance
Prepared By: M.Kordic/N.Hill
Date: 1/25/80
For Period: 1/1/81 to 12/31/81

Occupation	Code	Beginning of Period Total	0400	0800	0900	1000	1200	1300	1400	1700	1900	2600	2700	2800	3300	3400	3500	3600	3700	3800	3900	4000	4100	5300	5400	5500	5800	5900	6000	6100	6200	Transitions Out	Seperations
Administrative Secretary	0400	1	1																													
Assistant Maintenance Mech.	0800	1		1																												
Attendant	0900	11			11																											
Chemist IV	1000	1				1																										
Chief, Plant Operation	1200	1					1																									
Chief, Program Development	1300	1						1																								
Chief, Sewer Maintenance	1400	1							1																							
Clerk	1700	3								3																						
Deputy Dir., Oper. & Maintenance	1900	1									1																					
Equipment & Backhoe Operator	2600	3										1	2																		2	
Equipment Operator	2700	12										3	9																		3	
Foreman, Sewer Maintenance	2800	8											8																			
Instrument Technician/IX	3300	1												1																		
Laborer (Local 48)	3400	3												2	2																	
Laborer (Local 1099)	3500	8													2	2																1
Maintenance Mechanic (1099)	3600	2														2										6					6	
Maintenance Mechanic I (48)	3700	0															2	6														
Maintenance Mechanic II	3800	4																6	4													
Operator I	3900	11																	9	1												
Operator II	4000	5																		5	1										1	1
Operator III	4100	2																			4											1
Superintendent/WW TP	5300	4																				2	2									
Superintendent/Sewer Maint.	5400	2																					2									
Technician V/Lab Tech. II	5500	2																						2								
Sewer Maintenance I	5800	6										6													6						6	
Assistant Superintedant	5900	1																								1						
Supervisor (Maintenance Crews)	6000	4																									4					
Mail and Samples Carrier	6100	1																										1				
Building Maintainer	6200	2																											2			
																															4	12
Transitions In											3	6	2								1					6						
New Hires												1				6											1					
End of period total			1	1	11	1	1	1	1	3	1	4	16	10	1	2	8	2	0	4	9	6	1	4	2	2	6	1	5	1	2		

92

(EXHIBIT XIV) ANALYSIS OF WORKFORCE

Organization: County Sanitary Engineer

Department: Operations & Maintenance

Prepared by: M.Kordic/N.Hill

Date: 1/25/80

For Period: 1/1/80 to 12/31/80

Code	Occupation	Employment From 1/1/80	Employment To 12/31/80	Net Change in Occupations required	Decreases: Transitions Out	Decreases: Seperations	Decreases: Total	Increases: Transitions In	Increases: New Hires	Increases: Total
0400	Administrative Secretary II	1	1							
0800	Assistant Maintenance Mech.	1	1							
0900	Attendant	12	11	-1		1	1			
1000	Chemist IV	1	1							
1200	Chief, Plant Operation	1								
1300	Chief, Program Development	1	1							
1400	Chief, Sewer Maintenance	1	1							
1700	Clerk	3	3							
1900	Deputy Dir., Oper. & Maintenance	1	1							
2600	Equipment & Backhoe Operator	2	3	+1				1		
2700	Equipment Operator	14	12	-2	1	1	2			
2800	Foreman, Sewer Maintenance	8	8							
3300	Instrument Technician/IX	1	1							
3400	Laborer (Local 48)	3	3							
3500	Laborer (Local 1099)	16	8	-8	8		8			
3600	Maintenance Mechanic (1099)	2	2							
3700	Maintenance Mechanic I (48)	0	0							
3800	Maintenance Mechanic II (48)	4	4							
3900	Operator I	12	11	-1		1	1			
4000	Operator II	7	5	-2		2	2			
4100	Operator III	2	2							
5300	Superintendent/WW TP	4	4							
5400	Superintendent/Sewer Maint.	2	2							
5500	Technician V/Lab Tech. II	2	2							
5800	Sewer Maintenance I	0	6	+6				6		6
5900	Assistant Superintendent	2	1	-1	1		1			
6000	Supervisor (Maintenance)	0	4	+4				1	3	4
6100	Mail and Samples Carrier	1	1							
6200	Building Maintainer	0	2	+2				2		2
	TOTAL	104	102	-2	10	5	15	10	3	13

(EXHIBIT XV) ANALYSIS OF WORKFORCE CHANGES

Organization: County Sanitary Engineer
Department: Operations & Maintenance
Prepared by: M. Kordic/N. Hill
Date: 1/25/80
Period: 1/1/81 to 12/31/81

Code	Occupation	Employment From 1/1/81	Employment To 12/31/81	Net Change in Occupations required	Decreases: Transitions Out	Decreases: Seperations	Decreases: TOTAL	Increases: Transitions In	Increases: New Hires	Increases: TOTAL
0400	Administrative Secretary II	1	1							
0800	Assistant Maintenance Mech.	1	1							
0900	Attendant	11	11							
1000	Chemist IV	1	1							
1200	Chief, Plant Operation	1	1							
1300	Chief, Program Development	1	1							
1400	Chief, Sewer Maintenance	1	1							
1700	Clerk	3	3							
1900	Deputy Dir., Oper. & Maintenance	1	1							
2600	Equipment & Backhoe Operator	3	4	+1	2		2	3		3
2700	Equipment Operator	12	16	+4	3		3	6	1	7
2800	Foreman, Sewer Maintenance	8	10	+2				2		2
3300	Instrument Technician/IX	1	1							
3400	Laborer (Local 48)	3	2	-1		1	1			
3500	Laborer (Local 1099)	8	8		6		6		6	6
3600	Maintenance Mechanic (1099)	2	2							
3700	Maintenance Mechanic I (48)	0	0							
3800	Maintenance Mechanic II (48)	4	4							
3900	Operator I	11	9	-2	1	1	2			
4000	Operator II	5	6	+1				1		1
4100	Operator III	2	1	-1		1	1			
5300	Superintendent/WW TP	4	4							
5400	Superintendent/Sewer Maint.	2	2							
5500	Technician V/Lab Tech. II	2	2							
5800	Sewer Maintenance I	6	6		6		6	6		6
5900	Assistant Superintendent	1	1							
6000	Supervisor (Maintenance)	4	5	+1					1	1
6100	Mail and Samples Carrier	1	1							
6200	Building Maintainer	2	2							
	TOTAL	102	107	+5	18	3	21	18	8	26

B. Analysis of Workforce Needs

The information from the transition analysis is summarized on the Analysis of Workforce Needs (Exhibit XIV and XV). It readily identifies the means of meeting desired employment levels, where losses occur and sources of accession. This worksheet should balance in two respects. First, the total for "transfers out" and "transfers in" must match by the nature of the personnel action. Second, the total in the "new change" column should be the same as the difference between the sum of increases and the sum of decreases.

Task 6 - Develop Staffing Plan

The Staffing Plan (Exhibit XVI) is intended to provide a management type document. It presents for the current year, and future years the positions to be allocated and the man-years to be worked. Since this project was conducted at the end of 1979, the man-year column for that year reflects the actual accumulation of time expended by the personnel. For the purpose of this project, the payroll records as of November were used and the remainder of the year was projected and added to the to date figures. The position column for '79 shows the budgeted positions which were expected to meet the department's needs. When man-years exceed positions within an occupational title in the planning process (i.e. 1980 or '81) they reflect expected overtime in that area. Also indicated on the Staffing Plan is the pay grade for each occupational title. This is an aid for management in deciding on cost effective personnel mix and formulation budget projections.

(EXHIBIT XVI) STAFFING PLAN

Organization: County Sanitary Engineer Department: Operations & Maintenance

Prepared by: M.Kordic/N.Hill Date: 1/25/80

OCCUPATIONAL TITLE	CODE	PAY GRADE	Present and Planned Manpower Needs by Manyears and Positions					
			1979		1980		1981	
			MY	POS	MY	POS	MY	POS
Administrative Secretary II	0400	CT 10	1	1	1	1	1	1
Assistant Maintenance Mech.	0800	L 48	1	1	1	1	1	1
Attendant	0900	L 48	12	12	11	11	11	11
Chemist IV	1000	PA 4	1	1	1	1	1	1
Chief, Plant Operation	1200	PA 6	1	1	1	1	1	1
Chief, Program Development	1300	PA 6	1	1	1	1	1	1
Chief, Sewer Maintenance	1400	PA 6	1	1	1	1	1	1
Clerk	1700	CT 2	3.1	3	3	3	3	3
Deputy Dir., Oper. & Maintenance	1900	PA 7	1	1	1	1	1	1
Equipment & Backhoe Operator	2600	L 1099	2.1	2	3	3	4	4
Equipment Operator	2700	L 1099	14.1	14	12	12	16	16
Foreman, Sewer Maintenance	2800	L 1099	8.1	8	8	8	10	10
Instrument Technician/IX	3300	CT 11	1	1	1	1	1	1
Laborer (Local 48)	3400	L 48	3	3	3	3	2	2
Laborer (Local 1099)	3500	L 1099	16.1	16	8	8	8	8
Maintenance Mechanic (1099)	3600	L 1099	2.1	2	2	2	2	2
Maintenance Mechanic I (48)	3700	L 48						
Maintenance Mechanic II (48)	3800	L 48	4	4	4.4	4	4.5	4
Operator I	3900	L 48	12	12	11	11	9	9
Operator II	4000	L 48	7	7	5	5	6	6
Operator III	4100	L 48	2	2	1.7	2	1	1
Superintendent/WW TP	5300	PA 4	4.3	4	4.5	4	3.9	4
Superintendent/Sewer Maint. II	5400	PA 1	2	2	2	2	2	2
Technician V/Lab Tech. II	5500	CT 7	2	2	2.3	2	2	2
Sewer Maintenance I	5800	L 1099			6	6	6	6
Assistant Superintendent	5900	PA 4	2	2	1	1	1	1
Supervisor (Maintenance Crews)	6000	PA 4			4	4	5	5
Mail and Samples Carrier	6100		1	1	1	1	1	1
Building Maintainter	6200				2	2	2	2
TOTAL			104.8	104	102.9	102	107.4	107

Task 7 - Develop a Training Plan

Once the organization has projected the changes its workforce will undergo during the planning period it can decide on the proper personnel actions to meet its needs. The purpose of this task is to list the specific training courses that will be needed by members of the organization. Although the basis for this determination can be primarily derived from the workforce transition analysis, training needs for members of the organization who do not move must also be considered. Three types of training will be required:

1. Entry. This is to orient and train new employees.
2. Upgrade. This is to prepare personnel to assume higher level duties.
3. Update. This is to provide new skills and knowledges to employees so that they can better implement new technology or operating procedures. Also included in this catagory is training to improve proficiency in ongoing activities.

In the FY '80 budget of the County Sanitary Engineer, $15,000 has been appropriated for training.

In developing the Training Plan, the workforce planner uses the Training Catalog and the Analysis of Workforce Needs to determine the specific courses required for new hires and transfers as they are identified on the position descriptions.

Line supervisors determine what kinds of courses will help personnel continue their education in ways that are consistent with the training plan.

The Training Plan (Exhibit XVII) lists the course title, occupational title and code, the number of employees to be trained, the source of training, and the costs.

EXHIBIT XVII TRAINING PLAN

ORGANIZATION: County Sanitary Engineer

DEPARTMENT: Operations & Maintenance For Period: From 1/1/80 To 12/31/80

PREPARED BY: M. Kordic/N. Hill

DATE: 1/25/80

CODE	OCCUPATIONAL TITLE	NO. OF EMP.	COURSE NUMBER AND TITLE	VENDOR/LOCATION	COST PER EMPLOYEE TUITION	COST PER EMPLOYEE TRAVEL	TOTAL COST
0400	Administrative Secretary II	1	OADM 106: Filing and Records Control	Cuyahoga Community College	30.	---	30.
0800	Assistant Maintenance Mechanic	1	ELEC 120: Intro. to Electricity & Electrical Circuits	Cuyahoga Community College	30.	---	30.
0900	Attendant	3	Operator I Training	Cuyahoga Community College	30.	---	90.
1000	Chemist	1	INDT 261: Intro. to Statistical Quality Control	Cuyahoga Community College	30.	---	30.
1000	Chemist	1	Class II Workshop	Operator Training Commission of Ohio (Oberlin)	100.	10.	110.
1200	Chief, Plant Operation	1	BADM 220: Human Relations in Business	Cuyahoga Community College	30.	---	30.
1200	Chief, Plant Operation	1	Treatment Process Evaluation Seminar	U.S. Environmental Protection Agency. 1 day @ Cincinatti	---	150.	150.
1200	Chief, Plant Operation	1	National WPCF Meeting	Water Pollution Control Federation. 5 days @ Las Vegas	100.	800.	900.
1300	Chief, Program Development	1	BADM 211: Production Control	Cuyahoga Community College	30.	---	30.
1300	Chief, Program Development	1	Pretreatment Seminar	U.S. Environmental Protection Agency. 1 day @ Chicago	---	150.	150.
1400	Chief, Sewer Maintenance	1	BADM 220: Human Relations in Business	Cuyahoga Community College	30.	---	30.
1400	Chief, Sewer Maintenance	1	National WPCF Meeting	Water Pollution Control Federation. 5 days @ Las Vegas	100.	800.	900.

50

49

EXHIBIT XVII TRAINING PLAN

ORGANIZATION: County Sanitary Engineer

PREPARED BY: M. Kordic/N. Hill

DEPARTMENT: Operations & Maintenance For Period: From 1/1/80 To 12/31/80

DATE: 1/25/80

CODE	OCCUPATIONAL TITLE	NO. OF EMP.	COURSE NUMBER AND TITLE	VENDOR/LOCATION	COST PER EMPLOYEE		TOTAL COST
					TUITION	TRAVEL	
1700	Clerk	2	OADM 102: Typewriting	Cuyahoga Community College	30.	---	60.
1700	Clerk	1	OADM 106: Filing and Records Control	Cuyahoga Community College	30.	---	30.
1900	Deputy Director Operations and Maintenance	1	BADM 111: Psychology of Supervision	Cuyahoga Community College	30.	---	30.
1900	Deputy Director Operations and Maintenance	1	Treatment Process Evaluation Seminar	U.S. Environmental Protection Agency. 1 day @ Cincinnati	---	150.	150.
2800	Foreman, Sewer Maintenance	5	CCC*: Collection System Maintenance Training	Cuyahoga Community College	30.	---	150.
2800	Foreman, Sewer Maintenance	4	Collections System Workshop	Operator Training Commission of Ohio (Columbus)	100.	40.	560.
3300	Instrument Technician IX	1	MECH 221: Applied Instrumentation	Cuyahoga Community College	30.	---	30.
3600	Maintenance Mechanic (1099)						
3700	Maintenance Mechanic I (48)	1	ARCH 221: Building Equipment	Cuyahoga Community College	30.	---	30.
3800	Maintenance Mechanic II (48)	2	ARCH 221: Building Equipment	Cuyahoga Community College	30.	---	60.
3900	Operator I	2	CCC*: Operator II Training	Cuyahoga Community College	30.	---	60.
3900	Operator I	4	Class I Workshop	Operation Training Commission of Ohio. Locations change around state	75.	25.	400.

*Not presently listed in college catalog

EXHIBIT XVII TRAINING PLAN

ORGANIZATION: County Sanitary Engineer

PREPARED BY: M. Kordic/N. Hill

DEPARTMENT: Operations & Maintenance For Period: From 1/1/80 To 12/31/80

DATE: 1/25/80

CODE	OCCUPATIONAL TITLE	NO. OF EMP.	COURSE NUMBER AND TITLE	VENDOR/LOCATION	COST PER EMPLOYEE TUITION	COST PER EMPLOYEE TRAVEL	TOTAL COST
4000	Operator II	2	Extended Airation Workshop	Operation Training Commission of Ohio. Locations change around state	75.	25.	200.
4000	Operator II	2	Class II Workshop	Operation Training Commission of Ohio. Locations change around state	75.	25.	200.
4100	Operator III	1	CCC*: WWTP Management Training	Cuyahoga Community College	30.	---	30.
4100	Operator III	1	Class III Workshop	Operator Training Commission of Ohio. Locations change around state	75.	25.	100.
5300	Superintendent WWTP	2	BADM 111: Psychology of Supervision	Cuyahoga Community College	30.	---	60.
5300	Superintendent WWTP	2	Extended Aeration Workshop	Operator Training Commission of Ohio. Locations change around state	75.	25.	200.
5300	Superintendent WWTP	2	Ohio WPCF Meeting	Water Pollution Control Federation (TBA)	50.	125.	350.
5300	Superintendent WWTP	2	Northeast Ohio WPCF Meeting	Water Pollution Control Federation (TBA)	50.	125.	350
5400	Superintendent, Sewer Maintenance	1	BADM 211: Production Control	Cuyahoga Community College	30.	---	30.
5400	Superintendent, Sewer Maintenance	2	Sewer Maintenance Seminar	U.S. Environmental Protection Agency. 1 day @ Columbus	75.	25.	200.
5400	Superintendent, Sewer Maintenance	2	Northeast Ohio WPCF	Water Pollution Control Federation (TBA)	50.	125.	350.
5400	Superintendent, Sewer Maintenance	2	Ohio WPCF Meeting	Water Pollution Control Federation (TBA)	50.	125.	350.

*Not presently listed in college catalog

EXHIBIT XVII TRAINING PLAN

ORGANIZATION: County Sanitary Engineer

PREPARED BY: M. Kordic/N. Hill

DEPARTMENT: Operations & Maintenance For Period: From 1/1/80 To 12/31/80

DATE: 1/25/80

CODE	OCCUPATIONAL TITLE	NO. OF EMP.	COURSE NUMBER AND TITLE	VENDOR/LOCATION	COST PER EMPLOYEE		TOTAL COST
					TUITION	TRAVEL	
5400	Superintendent, Sewer Maintenance	1	BADM 201: Work Simplification	Cuyahoga Community College	30.	---	30.
5500	Technician V/Lab Tech. II	1	OTCO Workshop	Operator Training Commission of Ohio. Locations change around state	75.	25.	100.
5800	Sewer, Maintenance I	4	CCC*: WWTP Management Training	Cuyahoga Community College	30.	---	120.
5900	Assistant Superintendent	1	CCC*: WWTP Management Training	Cuyahoga Community College	30.	---	30.
6000	Mail and Samples Carrier	1	Defensive Driving	National Safety Council Package taught in ouse	---	---	---

*Not presently listed in college catalog

III. CONCLUSIONS

This project in the Cuyahoga County Sanitary Engineer's Operations and Maintenance sections demonstrates the feasibility and usefulness of the workforce planning methodology. The project has become an ongoing process in the department. It will aid in budget preparations and help plan for recruitment and training.

The Workforce planning process also puts in place a mechanism which can used to attract and retain quality personnel. A highly visible career ladder, combined with early planning for upgrading and advancement provides incentive for people to remain with an organization. Also, training, which can be considered a fringe benefit, would tend to lower the rate of personnel leaving, especially those who are career minded in the field. This planning system should prove to be highly cost-effective in both the long and short run.

Perhaps the most significant outcome of the project, as certain supervisors have stated, is the fact that they were forced to consider their workers and their needs on an individual and interpersonal basis.

IV. PROBLEMS

No real problems were encountered in adapting the workforce planning process for the County Sanitary Engineer. The only difficulty was finding adequate staff time and support from the county department to develop and apply the process. This resulted in a slight delay in completing the project. Internal changes of the organization (i.e. occupational titles and table of organization) also caused some delay and duplication of effort, but did not complicate the project.

V. RECOMMENDATIONS

The following is a list of recommendations that were developed through the application of workforce planning methodology:

1. The County Sanitary Engineer should continue to refine the planning criteria and methodology developed in the project.

2. Since the crews in the maintenance yards began using a new functional organization chart in 1980, they should also incorporate a new form of record keeping which would show 1) type of crew; 2) crew members; 3) travel time; 4) type of job and; 5) job time. This information would allow for the development of standardized time estimates and good workload indicators.
3. While the positions descriptions presently being used have been functional in the past, they appear to be a collection gathered over time with no internal consistency or standard format. This should be rectified now that the table of organization and occupational codes are finalized. The occupational codes should then be added to the position descriptions along with a component on training requirements. The standardized position descriptions should follow the following format:

    - Function
    - Occupational Title and Code
    - Duties
    - Education and Experience
    - Training Requirements (update, upgrade, short courses)

4. The duties of a workforce planner should be assigned to an individual within the department and the process should be extended to other functional areas of the County Sanitary Engineer's department. This person would be responsible for updating the products that were developed and extending the process to other sections in the department.
5. The County Sanitary Engineer should continue to utilize Cuyahoga Community College to develop and deliver training programs in response to his needs. Both the College and the County, through an advisory committe, should explore the possibility of developing an associate degree program in wastewater treatment.

6. Linkages should be developed and strengthened between the County Sanitary Engineer, the CETA compomponents of the County and the City of Cleveland and Cuyahoga Community College. This would open up a vast labor pool of individuals who could easily be brought into the organization in an entry level position, at a low or subsidized rate. At the same time it would open career possibilities for the CETA participants.

7. The College, through the College/County Manpower Project, should take the initiative to develop a program of instruction to teach others in government how to apply the workforce planning process and be able to provide continuing technical assistance for other units of state, county and city government. This would allow them to forecast their staffing, recruitment, and training needs. These needs could then be met in a cost effective way using a "rifle" rather than a "shotgun" approach. This would improve the overall effectiveness of government employees, the efficiency of tax dollars, and general delivery of government services.

APPENDIXES

APPENDIX I: TRAINING CATALOG COURSE DESCRIPTIONS

The courses described in Appendix I, as listed in the Training Catalog and offered by Cuyahoga Community College, were chosen for their academic content rather than for their sequential and prerequisite structuring. The College, through its versatile and flexible programming, is able to meet the educational need of the County Sanitary Engineer on a credit or non-credit basis. The scheduling of instruction should be agreed upon beforehand by both parties rather than merely being listed as a section in the Community College Class Schedule. The fact that some of the employees of the county do not have a high school diploma or the equivalent should not prevent the college from tailoring its educational resources to the needs of the local community. Under the auspecies of the Lifelong Learning Institute of the college, classes can be offered at campus or off-campus sites.

Other courses listed in the Training Catalog are administered by their respective agencies.

TRAINING CATALOG COURSE DESCRIPTIONS

ARCH-221	Building Equipment	Introduction to mechanical systems as applicable to building construction. Water supply, sanitation and acoustical systems. Environmental factors affecting systems design.
BADM-101	Introduction to Industrial Management	Concepts of modern-day, first-line supervision. Emphasis on the supervisor's major functions and development of sensitivity to human factors in management, using behavioral science findings.
BADM-111	Psychology of Supervision	Contemporary social-psychological theory and research on the person-to-person small group and organizational problems encountered by the modern manager.
BADM-201	Work Simplification	Principles, practices and techniques of the design, measurement and simplification of work, with emphasis on the relationship between man and machine.
BAD-220	Human Relations in Business	Basic motives of people in job situations. Company relationships with worker, suppliers and customers. Leadership development, communication and group processes.
CHMT-220	Introduction to Chemical Instrumentation	Beginning course consisting of lectures and demonstration of the theory, principles, design and operation of available chemical instruments. Flow of electronic signals and the information they represent in chemical instrument operation. Valuable fundamentals for chemistry students and practicing laboratory technicians.
ELEC-120	Introduction to Electric and Electronic Circuits	Introduction to electric-electronic terms, prefixes, components, symbols, circuits, and schematic diagrams. Use of Ohm's Law, Kirchoff's Voltage and Current Laws to solve simple two resistor series and parllel circuits. Practical laboratory experience with electronic voltmeter, dc ammeters, batteries, electronic power supplies, and the construction of working circuits.

ENGR-112	Engineering Report Construction	Oral, written and graphic methods of communication for the engineer and technician. Provides practice in preparation of technical reports.
INDT-261	Introduction to Statistical Quality Control	Application of statistical techniques in the analysis of data for the control of product quality and costs. Control charts, sampling systems and procedures. Correction of product variability. Theory of probability fundamentals. Solution of statistical problems related to specification, production of inspection. Statistical Quality control as a decision-making tool.
MECH-221	Applied Instrumentation Measurement and Control	Theory and practice applied to industrial measuring and controlling instrumentation. Types of equipment used to measure weight, pressure, flow, temperature and humidity are examined. Automatic control of the measured quantities is investigated.
OADM-101	Typewriting	Fundamentals of keyboard techniques and operation of the typewriter.
OADM-102	Typewriting	Continuation of OADM-101 Typewriting with an introduction to business letters and problem typing.
OADM-103	Typewriting	Continuation of OADM-102 Typewriting with emphasis on technical papers and business reports
OADM-106	Filing and Records Control	Instruction and practice in the preparation of office records for temporary and permanent storage. Includes alphabetic, geographic, numeric and subject filing systems. Detailed study of boty mechanical and manual filing methods. Emphasis on classification systems and the retrieval of filed information. Retention and disposition of all kinds of office records
PDS-103	Water Treatment	Water usage and purification. Industrial filtration, design, layout, function, operation and maintenance of water softeners, cooling towers and filters. Theory and practice of filtration systems in industry.

CCC*	Collection Systems Maintenance Training	Training program embraces design, construction and inspection of a typical collection system. Pertinent information on operation and maintenance of a collection system including lift stations are discussed in detail. Hazards in a collection system are evaluated along with safety hints.
CCC*	WWTP Management Training	Following main topics of importance for management training are discussed in detail: delegation, supervisory planning and decision making. A general overrun of the "profession" of supervision is discussed with particular emphasis on leadership, motivation and communication.
USEPA	Water Distribution System	Course covers the operation and maintenance of distributing systems. Basic mathematics is reviewed along with theory of operation. The mathematics includes whole numbers, fractions, decimals, squares and square roots, simple formulas, plane geometry, volume, weighted averages and review of basic principles.
USEPA	Pretreatment Seminar	A session designed to conduct effective waste survey from industrial sector. Such related problems as securing adequate legal authority, setting local standards, assessing administration and financial needs are discussed in detail. To meet regulatory requirements the program is augmented with technical considerations to determine POTW removal capabilities.
USEPA	Sewer Maintenance Seminar	Seminar covers sewer maintenance and related activities in the daily operation of sewer lines and the use of equipment such as high pressure water cleaners, vacum type of sewer cleaners, rodders, cable machine, and back hoes. The use of television cameras for inspection purposes of sewer lines and lead sealing equipment is discussed in detail.

* Not presently listed in college catalog

USEPA	Laboratory Methods	The program offers the opportunity to develop knowledge and skills to become proficient to do basic tests in the laboratory. The tests learned help the operator in evaluating plant performance and efficiency. It also assists the operator to learn fundamental chemical prinicipals of chemistry and their applications. Emphasis is placed on the application of scientific methodology.
OTCO	Collection System Workshop	A comprehensive review of the operation and maintenance of a collection system which conveys ground water, surface water and storm water through the component parts of a collection system. An in depth study is made of gravity sewers, force mains, manholes, pumping equipment and other facilities that collect and deliver the water to a wastewater treatment facility. Common problems and solutions are discussed in detail.
OTCO	Extended Aeration	Workshop will discuss in detail the extended aeration process and related problems that arise in the course of operation and maintenance with emphasis on operation control to include a study of micro organisms to be found in extended aeration. The application of tertiary filtration is included in the discussion of the process.
OTCO	Class I Workshop	Designed for least experienced personnel interested in operation of treatment plants. The sessions emphasize purpose, theory and the use of treatment plants units and the evaluation of the performance of each unit and mathematical calculations fo some of the units.
OTCO	Class II Workshop	For operators who have acquired their Class I Operators Certificate. Sessions include Terminology conversion to metric units, explanation of flow characteristics and flow patterns.
OTCO	Class III Workshop	For operators who have acquired their Class II or III Certification. Topics include applied Biology and Chemistry, characteristic of raw industrial and treated sewage along with process control tests. Following subject matters are also included: Theory of process control and design as it relates to

		hydraulics and pumping, preliminary treatment, sedimentation, biological filters; process control of activated sludge; contact stabilization, waste stabilization lagoons, sludge digestion and conditioning, dewatering and drying; final disposition of treatment plant effluent and sludge and other related subjects.
NSC	Defensive Driving Seminar	A course designed to raise questions concerning safe driving techniques. Sessions concentrate on such problems as how to avoid collision with vehicles oncoming, behind, at intersection as well as the art of passing and being passed. How to avoid other common types of collisions are discussed in detail.
	On The Job Training	Class sessions are augmented with plant training on a variety of equipment with pumping stations and treatment facilities. The multitude of equipment serviced offers technical training that cannot be developed in classroom only.
	National WPCF Meeting	Annual meetings held in different sectors of the country as designated by the Water Pollution Control Federation. The conference invites international figures to disseminate research, newly developed methodology, improved operation and maintenance procedures in the field of water pollution and related fields. Largest number of manufacturers exhibits under one roof are shown to acquaint registrants with newly designed equipment.
	Ohio WPCF Meeting	Meeting schedule annually within the State of Ohio. A variety of technical sessions covering a wide range of topics relavant to the wastewater field are presented. Special sections present new technologies in design, operation and maintenance.
	Northeast Ohio WPCF Meeting	Meetings are scheduled monthly for members of the WPCF whose treatment facilities are located in the NE sector of Ohio. Sessions are planned to acquaint consultants, designers and operators of problems of mutual interest. District members of the OEPA are usually represented to acquaint the group with interpretation of regulations and to clarify legal aspects of EPA requirements.

APPENDIX II: COST OF WORKFORCE PLANNING

The costs involved in implementing the Workforce Planning Process in the Sanitary Engineer's Operations and Maintenance sections were as follows:

Manpower Planner	$1,990.00
Consultant Services (professional fee & expenses)	1,650.00
Secretarial Support	760.00
Miscellaneous Expenses (Supplies, Communications & Reprographics)	75.00
TOTAL COST *	$4,475.00

*Excluding indirect costs of supervisory personnel and physical plant.

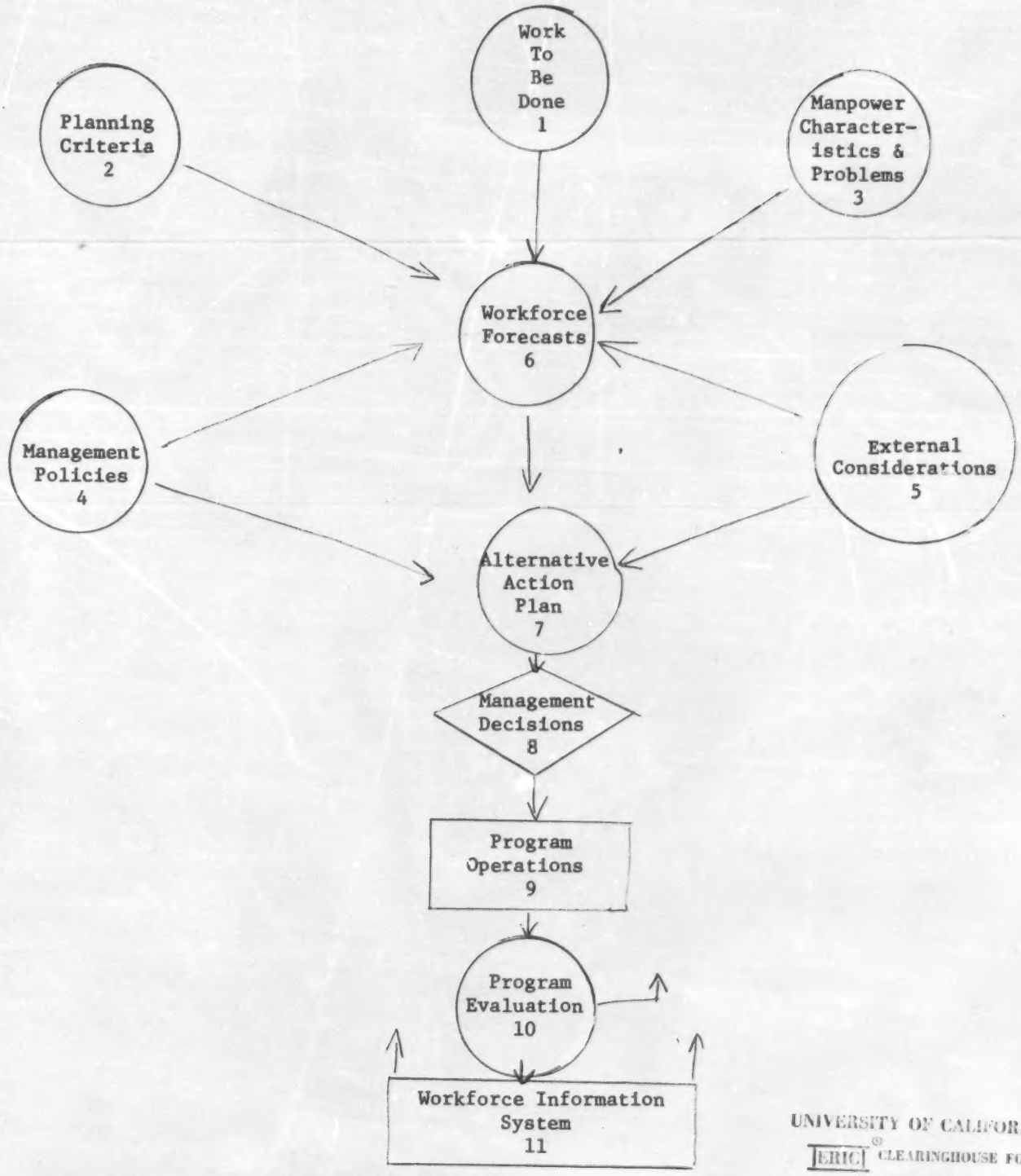
APPENDIX III: WORKFORCE PLANNING SYSTEM

Workforce Planning is part of the management function. It consists of a series of integrated and iterative tasks directed to the development of information and recommendations for making cost effective decisions on the recruitment, development and utilization of human resources.

The tasks are accomplished in conjunction with the organization's basic management processes. They involve line managers and the budget, personnel, management engineering and planning staffs. The tasks summarized in the model include:

1. Define and quantify the work to be done in the planning period. This is done in conjunction with the annual budget process and longer range program/strategic planning.
2. Develop and maintain a body of workforce planning criteria.
   a. An occupational structure consisting of titles, codes and definitions which label and define the duties, qualifications, training requirements, and relationships of the various positions within the organization.
   b. Time standards and staffing guides developed with work measurement techniques to translate workloads into qualitative/quantitative personnel requirements.
   c. Training criteria to relate specific training courses with occupations and provide information on costs, time required and sources of training delivery.
3. Measure characteristics of the workforce; assignments, qualifications, age, turnover, productivity and other factors or problems which affect its development, retention and performance.
4. Identify management policies and objectives concerned with employment, development and utilization of human resources.
5. Identify external factors and resources that affect recruitment, development and utilization such as external labor supply, salary levels, legal requirements, services available from public and private employment agencies as well as educational institutions and proprietary schools.
6. Forecast future workforce characteristics and requirments; employment levels, new hires or reduction-in-force, retirement, transfers and training loads.
7. Plan alternative actions to meet workloads, recruitment and training needs, and to overcome personnel problems. With consideration to costs and benefits, prioritize alternatives for management decisions.

8. Obtain management decisions on staffing levels and contract services; recruitment and training programs; productivity improvement and other personnel actions.
9. Implement Manpower Actions. This is the responsibility of line managers together with personnel, training, management, engineering and other responsible staffs. (Not a workforce planning task)
10. Monitor and evaluate effectiveness of workforce actions. Recommend actions to improve personnel policies and the operations of the organization.
11. Develop and operate an information system to provide the data for analytic and planning tasks and to facilitate management and operation of human resource related activities.



UNIVERSITY OF CALIFORNIA
ERIC CLEARINGHOUSE FOR
JUNIOR COLLEGES
96 POWELL LIBRARY BUILDING
LOS ANGELES, CALIFORNIA 90024
EE 36

JUL 11 1980